REMARKS

Status of Claims: Claims 1-28 are pending in the present application. Claims 1-28 have been rejected in the Office Action dated February 4, 2008. Claims 1, 11, 16, 17, and 22 have been amended. Claims 4, 5, 7, 9, 15, and 26 have been canceled without prejudice. Claims 29 and 30 are new. Upon entry of the current amendments, claims 1-3, 6, 8, 10-14, 16-25, and 27-30 will be pending. Support for the amendments can be found throughout the specification, and particularly, claim 1 has been amended to incorporate the limitations of canceled claim 5, claim 11 has been amended to incorporate the limitations of canceled claim 15 as well as to incorporate the language "optical axis" that can find support throughout the specification, and, for example, at page 9, lines 29-30, claims 16 and 17 have been amended to depend from the amended claim 11, rather than from canceled claim 15, claim 22 has been amended to incorporate the limitations of canceled claim 26, claim 29 has been added to incorporate the limitations of independent claim 1 and canceled claims 4 and 7, and claim 30 has been added to incorporate the limitations of independent claim 1 and canceled claim 9. No new matter has been entered, upon entry of these amendments. Applicant reserves the right to file one or more continuing applications in order to seek any original claim scope.

Claim Rejections Under 35 USC § 102:

In the Office Action, claims 1, 2, 8, 10-12, 15, 17, 18, 22, 23, 25 and 27 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Chen et al. (U.S. Pat. No. 5,710,829). In view of the claim amendments and the arguments presented below, Chen does not disclose all of the elements of claims 1, 2, 8, 10-12, 17, 18, 22, 23, 25 and 27, therefore withdrawal of the rejection of these claims under 35 U.S.C. 102(e) is solicited.

Claim 1 has been amended to include the limitations of canceled claim 5. Claim 1 as amended recites, in pertinent part, determining a first plurality of focus scores for the first digital image using the digital gradient filter with a first ***plurality of spatial extents***. Chen does not teach or suggest determining a first plurality of focus scores for the first digital image using the digital gradient filter with a first ***plurality of spatial extents***. Details of this argument are

presented below during discussion of the patentability of claim 17. Claims 2, 8, and 10 depend from amended independent claim 1, which includes the limitations of canceled claim 5. Therefore, all of the limitations of claims 1, 2, 8, and 10 are not taught or suggested by Chen.

Claim 11 has been amended to incorporate the limitations of canceled claim 15 as well as to incorporate the language "optical axis". Claim 11 as amended recites, in pertinent part, the instrument being further adapted for determining from a plurality of focus scores ***for a plurality of images*** an ***optical axis*** focus position for the object. Chen teaches the following (col. 7, lines 35-44):

> [T]he blocks of ***a frame signal*** are segmented into foreground and background based on the depth measurement of each block. In particular, focused edges are detected. These edges are assumed to border the foreground portion of the frame. An outline is created from the focused edges. A signal including information concerning the outline and the original frame signal is created and sent to an encoder in which the foreground may be treated as more pertinent and the background treated as less pertinent.

In the Office Action Response, p.5, Examiner stated that Chen teaches the instrument being further adapted for determining from a plurality of focus scores ***for a plurality of images*** a focus position for the object. This is not taught in Chen. Rather, Chen teaches detecting focused edges from the blocks of "a [single] frame signal." Claim 11, in contrast, teaches determining from a plurality of focus scores ***for a plurality of images*** an ***optical axis*** focus position for the object. Claim 18 depends from amended independent claim 11, which includes the limitations of canceled claim 15. Therefore, all of the limitations of claims 11 and 18 are not taught or suggested by Chen.

Regarding claim 17, in the Office Action Response, p.5, Examiner stated:

> Regarding claim 17, Chen discloses the optical instrument according to claim 15, the instrument being adapted to determine for each image a plurality of focus scores using a plurality of spatial extents (corresponding to "***The focus of each block is measured***" in col. 7, lines 47, 48) for the combined gradient and smoothing operator.

Applicant respectfully suggests that Examiner has misunderstood the teachings of Chen. Chen does not contemplate ***using a plurality of spatial extents*** to determine for each image a plurality of focus scores. As Examiner states, Chen does state that "the focus of each block is

measured." However, the discussion of "block" in Chen is as follows (col. 7, line 64 to col. 8, line 7):

> The original frame is divided into blocks, preferably comprising a 4x4 matrix of pels, at block 61. Each pel may be assigned to more than one block such that there is block overlap. The luminance component of each pel is combined with the luminance component of each other pel in the block at block 62, as is known in the art. The combined luminance value is assigned to the location of one of the pels in the block as is known in the art. This process is continued for each block until each pel has been assigned a combined luminance value, thereby creating a smoothed frame signal.

Although Chen discusses combining luminance components of each pel to create a smoothed frame signal, there is ***no contemplation of using a plurality of spatial extents*** to determine a plurality of focus scores for ***a single image***. Therefore, all of the limitations of claim 17 are not taught or suggested by Chen.

Claim 22 has been amended to include the limitations of canceled claim 26. Claim 22 as amended recites, in pertinent part, wherein the combined gradient and smoothing operator is a first spatial derivative of a Gaussian function. Chen does not teach or suggest wherein the combined gradient and smoothing operator is a first spatial derivative of a Gaussian function. Details of this argument are presented below during discussion of the 35 U.S.C. 103(a) rejection of claim 26. Claims 23, 25 and 27 depend from amended independent claim 22, which includes the limitations of canceled claim 26. Therefore, all of the limitations of claims 22, 23, 25, and 27 are not taught or suggested by Chen.

Claim Rejections Under 35 USC § 103(a):

Claims 3, 9, 13, 19, 21, 24, and 26 are rejected in the Office Action under 35 U.S.C. 103(a) as allegedly being unpatentable over Chen et al. (U.S. Pat. No. 5,710,829) in view of Hartman (U.S. Pat. No. 4,592,089). Applicant respectfully suggests that all of the limitations presented in claims 3, 13, 19, 21, 22 (incorporates all of the limitations of claim 26), 24, and 30 (incorporates all of the limitations of claim 9) are not present in Chen and Hartman as Examiner has suggested.

In the Office Action Response, p.6, Examiner stated:

> wherein the combined gradient and smoothing operator (fig. 5, numerals 51 and 52) ***is defined by*** the linear correlation or convolution ("convolution" in col. 6, line 56) of the pixel values with a mathematical smoothing function (or "Gaussian function" in col. 7, line 2 that blurs).

Applicant respectfully suggests that Examiner has misunderstood the teachings of Chen. Unlike Examiner's characterization of Chen, the steps "***measure focus***" (fig. 5, numeral 51) and "***smooth frame***" (fig. 5, numeral 52) ***are not defined by*** and ***do not relate to*** the "***convolution***" in col. 6, line 56. In fact, the entire discussion involving "convolution" in Chen (col. 6, line 56 to col. 7, line 34) takes place within a description of how the brightness of parts of a "blurred image" is spread across the image. This part of Chen does not describe any parts of Chen's invention; it merely discusses the prior art blurring problem that is useful in understanding Chen's invention. This can be most easily understood by noting that Chen begins that section of disclosure by stating "the blurred image can be described," (col 6, line 56) which begins the discussion of prior art phenomena. Therefore, Chen does not disclose the limitations of claim 3 (and similar language in claims 13, 19, 22, 24, and 30) that state "wherein the combined gradient and smoothing operator is defined by the linear correlation or convolution of the pixel values with a mathematical smoothing function." ***There is no step in Chen's invention that performs a correlation or convolution of pixel values with a mathematical smoothing function***.

In the Office Action Response, p.7, Examiner stated:

> Hartman teaches … the remaining limitations of: having a negative and positive lobe around the origin (as shown in fig. 10) thereof, the mathematical smoothing function (said CSSMTH) having only one zero crossing (as shown in fig. 10) and being limited in spatial extent (fig. 10 shows limits P1 and P2) in that it extends over a distance (as shown by the doubled headed arrow in fig. 9) smaller than or equal to the image size (as shown in fig. 10 that has a length of P1 to P2) and extends (as shown by a larger double headed arrow in fig 8) at least over three pixels (as shown by the dashed box in fig. 8) either side of a pixel (fig. 8: X0, Y0)) whose value is being filtered (corresponding to said smoothing function that "copes" in col. 10, line 38 for noise that is "amplified" in col. 10, line 39 due to the "differentiation process" in col. 10, line 40.)

Applicant respectfully suggests that Examiner has misunderstood the teachings of Hartman. Figs. 8-10 of Hartman do not discuss a mathematical smoothing function at all. In

fact, ***no details of the CSSMTH "smooth" step are disclosed*** in Hartman, other than to simply state that "the polar cross-section is then differentiated and smoothed" (col. 10, lines 26-27). On the other hand, Hartman's remaining discussion of "Cross-Section Boundary Detection (CSSEG)" (col. 10, line 27 to col. 11, line 13), makes no reference to a mathematical smoothing function as Examiner states. Although Examiner states that figs. 8-10 refer to some of the limitations of the mathematical smoothing function of claim 3 (and similar language in claims 13, 19, 22, 24, and 30), this can not possible be accurate, considering that ***figs. 8-10 do not relate to a mathematical smoothing function***.

Claim 21 depends from independent claim 13, so the same argument related to the limitations of claim 13 also applies to claim 21. For the foregoing reasons, Chen, whether alone or in combination with Hartman, does not teach or suggest all of the limitations of claims 3, 13, 19, 21, 22 (incorporates all of the limitations of claim 26), 24, and 30 (incorporates all of the limitations of claim 9). Therefore, withdrawal of the rejection these claims under 35 U.S.C. 103(a) is solicited.

Claims 4, 5, 7, 16, and 28 are rejected in the Office Action under 35 U.S.C. 103(a) as allegedly being unpatentable over Chen et al. (U.S. Pat. No. 5,710,829) in view of Frost et al. (U.S. Pat. No. 5,647,025). All of the limitations of claims 4 and 7 are incorporated into new claim 29. All of the limitations of claim 5 are incorporated into amended claim 1. Claim 16, as amended, depends from amended claim 11. Claim 28 depends from claim 27, which depends from amended claim 22, which incorporates all of the limitations of claim 26. Applicant respectfully suggests that all of the limitations presented in claims 1, 16, 28, and 29 are not present in Chen and Frost as Examiner has suggested.

Claim 1 has been amended to include the limitations of canceled claim 5. Claim 1 as amended recites, in pertinent part, determining a first plurality of focus scores for the first digital image using the digital gradient filter with a first ***plurality of spatial extents***. Neither Chen nor Frost teach or suggest determining a first plurality of focus scores for the first digital image using the digital gradient filter with a first ***plurality of spatial extents***. Details of this argument are presented above during discussion of the patentability of claim 17. Therefore, all of the

limitations of amended claim 1 are not taught or suggested by Chen, whether alone or in combination with Frost.

New claim 29 includes all of the limitations of canceled claims 4 and 7 and the previous claim 1. Claim 29 recites, in pertinent part, wherein the determining step includes fitting the focus scores to a polynomial function and moving the object and/or the optical instrument to a position related to a maximum of the polynomial function. Frost teaches, in pertinent part, peaks in the focus score in all regions are identified by looking for patterns across position of two positive derivatives followed by two negative derivatives (col. 8, lines 23-25). Neither Chen nor Frost teach or suggest wherein the determining step includes fitting the focus scores to a polynomial function and moving the object and/or the optical instrument to a position related to a maximum of the polynomial function. Therefore, all of the limitations of new claim 29 are not taught or suggested by Chen, whether alone or in combination with Frost.

Claim 16, as amended, depends from amended claim 11. Claim 28 depends from claim 27, which depends from amended claim 22, which incorporates all of the limitations of claim 26. Because all of the limitations of amended independent claims 11 and 22 are not taught by Chen, all of the limitations of dependent claims 16 and 28 are not taught by Chen. Also, for the reasons mentioned above, all of the limitations of claims 16 and 28, which contain some similar language to claim 29, are not taught or suggested by Chen, whether alone or in combination with Frost.

Claims 6 and 20 stand rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Chen et al. (U.S. Pat. No. 5,710,829) in view Ortyn et al. (U.S. Pat. No. 5,841,124). Claims 6 and 20 depend from independent claims 1 and 11, respectively. In view of the amendments and arguments presented above related to the patentability of claims 1 and 11, withdrawal of the rejection of claims 6 and 20 under 35 U.S.C. 103(a) is solicited.

Claim 14 stands rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Chen et al. (U.S. Pat. No. 5,710,829) in view of Hartman (U.S. Pat. No. 4,592,089) as applied to claim 3 above, and further in view of Ortyn et al. (U.S. Pat. No. 5,841,124). Claim 14 depends from independent claim 11. In view of the amendments and arguments presented above related to the

patentability of claim 11, withdrawal of the rejection of claim 14 under 35 U.S.C. 103(a) is solicited.

CONCLUSION

It is respectfully submitted that each and every claim pending in this application patentably defines over the prior art of record. For all the foregoing reasons, Applicant respectfully submits that the instant application is in condition for allowance. Reconsideration of the present Office Action and an early Notice of Allowance are respectfully requested.

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